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# **The association between maternal obesity and exclusive breastfeeding practice in Yogyakarta 2019**

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**Abstract**---Obesity, especially in pregnant women, could cause many health problems regarding both the individual and the baby related to the tendency not to exclusively breastfeed in the future. This study aim to know the association between maternal obesity and exclusive breastfeeding (EBF) practice. This study was an observational analytic (non-experiment) with a historical cohort design, carried out between November 2018-June 2019. The population was all first trimester pregnant women between March 2016-December 2017 who had first antenatal care in Tegalrejo and Mantrijeron Primary Health Care. The sample used was 130 respondents divided into two groups, 68 as exposed and 62 as non-exposed group. Sampling technique used was multistage random sampling. This study analyzed six variables, which were maternal obesity, age, education, occupations, knowledge, and attitude. Data collected using form and questionnaire. Chi-square test and logistic regression were used in data analysis. There was an association between maternal obesity and EBF practice. After controlling the attitude variable, maternal obesity had significance ( $p=0,002$ ) toward EBF practice. The failure of EBF was higher 1,74 times in obese mother ( $RR=1,74$ ). Maternal age, education, occupations, and knowledge was proved not statistically significant toward EBF practice ( $p=0,956$ ;  $0,137$ ;  $0,203$ ;  $0,337$  respectively). Probability of EBF failure on obese mother and had negative attitude toward EBF was 91%. Therefore we conclude that maternal obesity is a risk factor toward the failure of EBF practice.

**Keywords**---maternal obesity, EBF, maternal characteristic.

## Introduction

Obesity is a condition in which a person experiences over nutrition especially fat accumulation which causes body weight far exceeding normal, which is characterized by a Body Mass Index (BMI) of more than  $29.9 \text{ kg/m}^2$  according to the Institute of Medicine (IOM). The World Health Organization (WHO) states that in 2016 there were 1.9 billion adults ( $> 18$  years) suffering from overweight and 650 million suffering from obesity all over the world. Of these numbers, 40% of the adult female population in the world falls into the category of overweight.<sup>1</sup>

The prevalence of obese population in Indonesia in 2016 with BMI  $\geq 25\text{-}27 \text{ kg/m}^2$  is 33.5%, while obese population with BMI  $\geq 27 \text{ kg/m}^2$  is 20.6%. In this amount, the prevalence was also higher in the female population, which was 41.4% compared to obesity in the male population. The prevalence of obesity in productive age in the Special Region of Yogyakarta (DIY) in 2016 is highest in the city of Yogyakarta, which is as much as 8.73%, followed by Sleman Regency as much as 1.19%.<sup>2</sup>

The city of Yogyakarta, which has the highest number of obesity at reproductive age, turned out to have the lowest number of exclusive breastfeeding coverage among other districts in DIY, which amounted to 66.13%. This figure is still below the average success rate of exclusive breastfeeding in DIY which amounted to 74.90%.<sup>2</sup>

Obesity is a chronic condition that tends to settle on a person<sup>3</sup>, therefore most maternal obesity (obesity that refers to pregnant women) occurs because a woman has been obese since pre-conception. Maternal obesity is associated with negative effects not only for the mother but also for the baby. Obese women will tend to breastfeed in a shorter duration. The reasons may be biological or they may be psychological, behavioral and/or cultural.<sup>4</sup>

On biological side, obese women will experience delayed onset of lactogenesis II.<sup>5</sup> In obese women there is high leptin in adipose tissue. Leptin plays a role in the regulation of the central Hypothalamus Pituitary Gonadal (HPG). In the reproductive system, leptin regulates reproductive function by changing the sensitivity of the pituitary gland to GnRH and plays a role in changing the ovaries from follicular and luteal steroidogenesis, proliferation, and apoptosis. The leptin hormone works because of Soluble Leptin Receptors (SLRs). In obese people, low levels of SLR will cause the person to be resistant to leptin, even though leptin levels are high in people with large fat tissue.<sup>6</sup>

The estrogen hormone in healthy pre-menopausal women is synthesized in the ovary under the regulation of gonadotropins realizing hormone from the pituitary gland. Estrogen is also produced in adipocytes via aromatization of androgen precursors.<sup>6</sup> In obese women, estrogen levels become higher, so that when the placenta is born, it takes a long time to reduce estrogen levels to a level that allows the prolactin hormone to be activated. Therefore, maternal obesity results

in the delayed onset of lactogenesis II.<sup>6</sup> The occurrence of lactogenesis was found to have a relationship with breastfeeding outcomes, including the success of exclusive breastfeeding.<sup>7</sup>

In Notoatmojo (2010) it is stated that influencing factors of exclusive breastfeeding practice consist of three factors. Predisposing factors include physical factors, mental processes, maturity of age, self-desire, self-management, education, knowledge, attitude, and socio-economic. Enabling factors include busyness, facilities and infrastructure, regulation, and availability of breastfeeding places/lactation room. While reinforcement factors include environmental factors, husband/family support, information support, award support, reinforcement, counseling, and media.<sup>8</sup>

Studies in Indonesia relate many factors mainly maternal characteristics including age, education, occupations, knowledge, attitudes with exclusive breastfeeding. Age and occupations are found to be associated with exclusive breastfeeding<sup>9</sup>, as well as knowledge and attitudes.<sup>10</sup> However, in several other studies the opposite results were found. The research of Felix, I Gusti Putu, *et al.* (2013) showed that there was no correlation between maternal characteristics in the form of age, number of hours occupations, welfare, and parity on exclusive breastfeeding.<sup>11</sup>

Although many studies in Indonesia have linked the characteristics of mothers with exclusive breastfeeding, it is rare to specifically examine maternal physical factors (maternal obesity). In this study the researcher intends to know the relationship between maternal obesity and the exclusive breastfeeding practice by controlling variables that are allegedly influence the EBF practice, including age, education, occupations/occupations, knowledge, and attitude.

## Method

This study was an observational analytic (non-experimental) study with a retrospective cohort design. The study was conducted between November 2018-June 2019. The population was first-trimester pregnant women in March 2016-December 2017 in the Tegalrejo and Mantrijeron Primary Health Care working areas. The minimum number of samples was calculated using the Lemeshow formula for the design of the cohort study and it was obtained the number of samples which is 62 for both the exposed group and the non-exposed group, so the total sample was 124. The sampling technique was multistage random sampling with matching residence between groups. But until the end of the study, the number of respondents was 130, respondents increased to 68 in the exposed group because some mothers had more than one toddler.

The research variables were maternal obesity, age, education, occupations, knowledge, and attitudes as independent variables and the success of exclusive breastfeeding as the dependent variable. The instruments used were form and questionnaires. The questionnaire was adopted from the research of Tine Augustine (2008) and Nur Rahman (2017) about the knowledge and attitudes of mothers regarding exclusive breastfeeding.

The researcher accessed the cohort of pregnant women at Tegalrejo and Mantrijeron Primary Health Care to obtain data on the weight and height of pregnant women in the first trimester in March 2016-December 2017 which would be categorized according to the Body Mass Index (BMI) to "normal" and "obese." Population with normal BMI was categorized in the non-exposed group and while the obese BMI was in the exposed group. In addition, the researcher obtained the address of the respondent from the cohort, then the researcher visited the respondent door to door to obtain other data using form and questionnaires. The data analysis was done by using the chi-square test to determine the relationship between two variables and logistic regression to determine the probability and influencing factors.

## Result

This study discussed six independent variables and their association to the dependent variable. The association between maternal obesity, age, education, occupations, knowledge, and attitudes with the success of exclusive breastfeeding and the characteristics of respondents are generally presented in the following table:

Table 1. Association between maternal obesity, age, education, occupations, knowledge, and attitudes with the success of EBF

| Variables        | Average EBF (month) | Non-EBF |     | EBF |     | Total |      | P-value     | X <sup>2</sup> | RR   | 95% CI |
|------------------|---------------------|---------|-----|-----|-----|-------|------|-------------|----------------|------|--------|
|                  |                     | n       | %   | n   | %   | N     | %    |             |                |      |        |
| Maternal obesity |                     |         |     |     |     |       |      | <b>0,00</b> | 10,9           | 1,74 | 1,227- |
| Obese            | 4                   | 4       | 67, | 2   | 32, | 68    | 52,3 | <b>1*</b>   | 27             | 8    | 2,489  |
| Not Obese        | 5,1                 | 6       | 6   | 2   | 4   | 62    | 47,7 |             |                |      |        |
|                  |                     | 2       | 38, | 3   | 61, |       |      |             |                |      |        |
|                  |                     | 4       | 7   | 8   | 3   |       |      |             |                |      |        |
| Age              |                     |         |     |     |     |       |      | 0,95        | 0,00           | 1,00 | 0,731- |
| <30 y.o          | 4,6                 | 4       | 54, | 3   | 45, | 74    | 56,9 | 6           | 3              | 9    | 1,392  |
| ≥30 y.o          | 4,3                 | 0       | 1   | 4   | 9   | 56    | 43,1 |             |                |      |        |
|                  |                     | 3       | 53, | 2   | 46, |       |      |             |                |      |        |
|                  |                     | 0       | 6   | 6   | 4   |       |      |             |                |      |        |
| Education        |                     |         |     |     |     |       |      | <b>0,13</b> | 2,20           | 1,37 | 0,964- |
| Low              | 4,2                 | 1       | 70, | 5   | 29, | 17    | 13,0 | <b>7*</b>   | 6              | 5    | 1,962  |
| High             | 4,5                 | 2       | 6   | 5   | 4   | 11    | 7    |             |                |      |        |
|                  |                     | 5       | 51, | 5   | 48, | 3     | 86,9 |             |                |      |        |
|                  |                     | 8       | 3   |     | 7   |       |      |             |                |      |        |
| Occupations      |                     |         |     |     |     |       |      | <b>0,20</b> | 1,62           | 1,23 | 0,894- |
| Employed         | 4,2                 | 3       | 59, | 2   | 40, | 62    | 47,7 | <b>3*</b>   | 2              | 0    | 1,692  |
| Unemployed       | 4,7                 | 7       | 7   | 5   | 3   | 68    | 52,3 |             |                |      |        |
|                  |                     | 3       | 48, | 3   | 51, |       |      |             |                |      |        |
|                  |                     | 3       | 5   | 5   | 5   |       |      |             |                |      |        |
| Knowledge        |                     |         |     |     |     |       |      | 0,45        | 0,92           | 1,35 | 0,822- |
| Low              | 3,7                 | 5       | 71, | 2   | 28, | 7     | 5,4  | 0           | 0              | 2    | 2,223  |
| Good             | 4,5                 | 6       | 4   | 5   | 6   | 12    | 94,6 |             |                |      |        |
|                  |                     | 5       | 52. | 8   | 47, | 3     |      |             |                |      |        |

|          |     |   |     |   |     |    |      |             |      |      |        |  |
|----------|-----|---|-----|---|-----|----|------|-------------|------|------|--------|--|
|          |     |   | 8   |   | 2   |    |      |             |      |      |        |  |
| Attitude |     |   |     |   |     |    |      | <b>0,03</b> | 4,77 | 1,73 | 0,432- |  |
| Negative | 3,6 | 8 | 88, | 1 | 11, | 9  | 6,9  | <b>7*</b>   | 8    | 0    | 0,770  |  |
| Positive | 4,6 | 6 | 8   | 5 | 1   | 12 | 93,0 |             |      |      |        |  |
|          |     | 2 | 51, | 9 | 48, | 1  | 7    |             |      |      |        |  |
|          |     |   | 2   |   | 7   |    |      |             |      |      |        |  |

Based on the table above, maternal obesity and attitude variables are variables that have p value <0.05, this means that maternal obesity variables and attitudes have a high significance on the dependent variable. The average length of exclusive breastfeeding is lower in obese mothers than in non-obese mothers, ie for 4 months. There are four variables that have p value <0.25, namely maternal obesity; education; occupations; and attitude variables, therefore the four variables entered into multivariate analysis.

The results of the chi square test on the age variable with the EBF practice showed p value 0.956 > 0.05 which means that statistically the age variable did not have a significant relationship to the EBF practice. Similar to the analysis on the knowledge variable, the chi square test produces p value 0.450 > 0.05 which also shows that the knowledge variable did not statistically have a significant effect on the EBF practice. Confounding tests using logistic regression are illustrated in the table below.

Table 2. Association between maternal obesity and EBF practice after being controlled the education, occupations, and attitude variables

| Variables        | B     | p-value | Exp(B)       | 95% CI |        |
|------------------|-------|---------|--------------|--------|--------|
|                  |       |         |              | Lower  | Upper  |
| Maternal obesity | 1,048 | 0,006   | <b>2,853</b> | 1,351  | 6,026  |
| Education        | 0,741 | 0,210   | 2,098        | 0,658  | 6,686  |
| Occupations      | 0,269 | 0,482   | 1,309        | 0,618  | 2,772  |
| Attitude         | 1,909 | 0,084   | 6,749        | 0,773  | 58,887 |
| Constant         | -     | 0,025   | 0,498        |        |        |
|                  | 0,697 |         |              |        |        |

Confounding test after the education variable was excluded, the value of Exp (B) in the main variable changed by 2.69%. This shows that the education variable was not a confounding factor and was not included in the next model. Furthermore, the occupations variable was excluded from the model and the Exp (B) value in the main variable changed by 7.75%, indicating that occupations was not a confounding factor. Whereas if the attitude variable was excluded, the Exp (B) value of the main variable changed 13.8% which indicated that the attitude variable was a confounding factor. Therefore, the final modeling of multivariate analysis is obtained as follows:

Table 3. Final model of the analysis on association between maternal obesity and EBF practice after being controlled the attitude variable

| Variables        | <i>B</i> | <i>p</i> -<br><i>value</i> | Exp(B) | 95% CI       |              |
|------------------|----------|----------------------------|--------|--------------|--------------|
|                  |          |                            |        | <i>Lower</i> | <i>Upper</i> |
| Maternal obesity | 1,129    | 0,002                      | 3,093  | 1,489        | 6,423        |
| Attitude         | 1,819    | 0,098                      | 6,112  | 0,715        | 52,258       |
| Constant         | -        | 0,052                      | 0,597  |              |              |
|                  | 0,516    |                            |        |              |              |

Table above shows that maternal obesity have more influence on the EBF practice compared to attitude variables. Judging from the *p* value for maternal obesity 0.002 < 0.05 which indicates that maternal obesity was very significant in influencing the success of exclusive breastfeeding, while the attitude variable had *p* value 0.098 > 0.05 which means that statistically there was no significant effect. Although the value of Odds Ratio (OR) seen from the value of Exp (B) on the attitude variable was greater, the Confident Interval (CI) range was also very large, which ranges from 0.715-52.258. This means that the meaningfulness of the relationship was likely due to chance so that it was less reliable. Whereas CI in maternal obesity variable had a relatively close range (1,489-6,423), so that the meaningfulness of relationships could be more trusted. The OR value of the maternal obesity variable was 3.093, meaning maternal obesity increased the risk of non-exclusive breastfeeding by 3.09 times. The results of the crosstabs test between maternal obesity variables and the EBF practice to determine RR values (relative risk) obtained RR=1.748, which means that non-exclusive breastfeeding was 1.74 times higher in obese mothers. Based on the results of the model equation it was found that the risk of exclusive breastfeeding failure in obese and had negative attitude mothers was 91%.

## Discussion

In this study, the average length of exclusive breastfeeding data was obtained through a questionnaire. The results showed that obese pregnant women had an average length of exclusive breastfeeding for four months, lower than the average length of exclusive breastfeeding for normal weight mothers (5.1 months). In line with the results of L. Amir et al. (2007), the study found that obese mothers would breastfeed their babies in shorter duration (6.9 months) than normal weight mothers (9.3-9.8 months).<sup>4</sup>

The shorter duration of breastfeeding could be attributed to the success of the exclusive breastfeeding program. It was said that a mother succeeds in giving exclusive breastfeeding if she is able to give breastmilk only without additional food or drinks including water, except the administration of vitamins in syrup, minerals and drugs.<sup>12</sup> In this study the chi square test result between maternal obesity and the EBF practice showed that the failure of exclusive breastfeeding was higher in obese mothers.

## **Maternal Obesity**

Notoatmojo (2010) explained that the influencing factors for exclusive breastfeeding include physical factors, in this case associated with maternal obesity. The results of this study indicate that maternal obesity was associated with the EBF practice. Maternal obesity increased the risk EBF failure by 3.09 times.

Theoretically, obese mothers will experience delayed onset of lactogenesis II compared to normal weight mothers.<sup>5</sup> This was caused by unstable hormonal conditions in individuals with excess fat tissue, in this case obese mothers. In addition, obese mothers also have a lower prolactin response than normal weight mothers.<sup>13</sup> The prolactin response will affect the production of breast milk stimulated by baby suction as well as regulation of the hormone progesterone.<sup>14</sup> If the prolactin response is slow, then milk production will tend to be less sufficient, as a result mothers will tend to breastfeed in a shorter time.<sup>13</sup>

The slower lactogenesis process (> 72 hours) was related to the statement in I Gusti Putu Felix et al's study, that mothers who did not immediately produce breast milk after giving birth, or who had little milk production, would be more inclined to provide additional food or drinks to the baby.<sup>11</sup> So there might be a relationship between the action of giving prelacteal food or drink mentioned in that study with maternal obesity.

Maternal obesity generally occurred because an individual had been suffering from obesity since pre-conception or adolescence, because obesity was a chronic condition that tends to settle on an individual.<sup>3</sup> Therefore, it is important to take preventive action to prevent obesity especially in young women so that obesity does not occur when they are pregnant.

## **Age**

Age maturity was also a predisposing factor for the EBF practice according to Notoatmojo (2010). In this study age was found not to be significantly related to the EBF practice. The age of respondents in this study was mostly under 30 years. However, in the group of respondents aged <30 years and ≥30 years, the proportion of mothers who failed to provide exclusive breastfeeding was greater than those who succeeded. Ryan et al. found that the prevalence of EBF and the duration of breastfeeding for six months was higher in older mothers.<sup>15</sup> While Wahyuningish (2013) study found that the age variable was not associated with exclusive breastfeeding<sup>16</sup>, in line with the results of this study.

Research by Bailey et al. Found that older mothers had a more positive attitude toward breastfeeding. This more positive attitude was influenced by psychological factors. Young mothers compared to older mothers, more often express shame for breastfeeding in public.<sup>17</sup> On the other hand, mothers who are more than 30 years old physiologically have a tendency to experience delayed lactogenesis compared to younger mothers. Mothers who experience delayed lactogenesis often lose confidence in breastfeeding and often claim breast milk was not enough for

babies so babies were often given prelacteal food which results in the failure of exclusive breastfeeding programs.<sup>18</sup>

### **Education**

Education was a predisposing factor according to L. Green's health behavior theory. In this study the results showed that education was not significantly associated with the EBF practice. Afi Lutfiyati et al's (2015) study showed the opposite, that education had a statistically significant effect on breastfeeding initiation and exclusive breastfeeding.<sup>19</sup> However, the results of this study were in line with the results of I Gusti Putu Felix et al (2013) that there was no association between education and the EBF practice.

A high level of education was one factor in shaping broad knowledge so that one has broader and more easily informed insight.<sup>8</sup> Although education levels affect one's knowledge, knowledge could still be obtained outside formal education<sup>8</sup>, so that it was not an absolute factor.

### **Occupations**

The results showed that there was no relationship between occupations and the EBF practice. In this study, about half of the respondents who are both employed and unemployed were failed to give exclusive breastfeeding. Most of the respondents who employed and succeed in providing exclusive breastfeeding were self-employed. Afi Lutfiyati *et al's* (2015) study said that mothers who did not work were 3.7 times more likely to give exclusive breastfeeding to their babies compared to working mothers.<sup>19</sup> Various policies have been recommended so that working mothers can still provide breastfeeding exclusively, such as extending maternity leave, providing a lactation room at work and the mother is allowed to take the baby to work.<sup>20</sup>

### **Knowledge**

Although this study showed that there was no statistically significant relationship between knowledge and the EBF practice, the study of Mariane W (2013) showed the opposite. In her research, the results showed that knowledge had a significant relationship to the EBF practice with p value 0,000 <0,05. Research by Fikawati, S., et al (2009) said that knowledge, both based on education and experience-based, was a very important factor and determines the success of exclusive breastfeeding.<sup>21</sup> However, in this study, the majority of the respondents (94.6%) have good knowledge but most of them did not succeed in giving exclusive breastfeeding (53.8%). Based on the recognition of the coordinating midwife at the Tegalrejo and Mantrijeron Primary Health Care, in the working areas of the two PHC, there had been frequent counseling/socialization related to exclusive breastfeeding, and the provision of Counseling, Information, and Education about exclusive breastfeeding must be given at least once during an antenatal visit.



## Attitude

Attitude variables proved to be statistically influential on the EBF practice reviewed from the 2x2 table test. Abdullah G and Ayubi D (2013) study said that the process of breastfeeding the baby was related to the attitude of the mother. The more positive the mother's attitude the greater the chance to give exclusive breastfeeding.<sup>22</sup> In this study it was found that 100% of mothers who had a negative attitude did not give exclusive breastfeeding. Hence, it is important to increase maternal awareness of exclusive breastfeeding so that they can have a more positive attitude toward EBF and increase the success of exclusive breastfeeding.

## Conclusion

Based on the results of this study it can be concluded that there is a statistically significant relationship between maternal obesity and attitudes with the EBF practice. There is no statistically significant relationship between age, education, employment, and knowledge to the EBF practice. The risk of exclusive breastfeeding failure in mothers who are obese and having negative attitude is 91%. Maternal obesity increased the risk of exclusive breastfeeding failure by 3.09 times. Failure on exclusive breastfeeding was 1.74 times higher in obese mothers.

The results of this study are expected to be used as a consideration material for making policies relating to improve the performance of health workers, especially midwives, in order to give more attention to young women to realize preventive measures against obesity. Counseling with a deeper approach for pregnant women is also needed so that pregnant women have a positive attitude towards exclusive breastfeeding.

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